



<b>Title</b>	Virtual career fairs: Perspectives from Norwegian recruiters and exhibitors
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<b>Publication date</b>	2018-02-12
<b>Original citation</b>	Vik, Å. S., Nørbech, B. and Jeske, D. (2018) 'Virtual Career Fairs: Perspectives from Norwegian Recruiters and Exhibitors', Future Internet, 10(2), 19 (16pp). doi: 10.3390/fi10020019
<b>Type of publication</b>	Article (peer-reviewed)
<b>Link to publisher's version</b>	<a href="http://www.mdpi.com/1999-5903/10/2/19">http://www.mdpi.com/1999-5903/10/2/19</a> <a href="http://dx.doi.org/10.3390/fi10020019">http://dx.doi.org/10.3390/fi10020019</a> Access to the full text of the published version may require a subscription.
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## Article

# Virtual Career Fairs: Perspectives from Norwegian Recruiters and Exhibitors

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Received: 26 December 2017; Accepted: 6 February 2018; Published: 12 February 2018

**Abstract:** The present work introduces virtual fairs, particularly the perceived benefits, challenges, and relevance of such fairs for recruitment and employer branding. These aspects were explored in a semi-structured interview with an organizer of virtual fairs across Scandinavia, and a focus group composed of Norwegian recruiters and exhibitors. The results of the data collection can be summarized in the form of themes that relate to web analytics, web services and optimization. The benefits of virtual fairs pertain to the (a) visibility and branding; (b) costs; and (c) analytics-based customization. Challenges of virtual career fairs pertain to the (a) lack of online engagement, (b) preparation and staffing costs; (c) lack of guidelines; (d) talent access and identification; (e) security and infrastructure; (f) long-term planning; (g) and inter-dependencies. The discussion summarizes the implications of branding and recruitment and the value they add to business, also noting how context effects may come into play. The article concludes by exploring the possibility that virtual fairs will complement or become the new standard in recruitment and outlines future avenues for research and practice.

**Keywords:** virtual fair; online fair; recruitment; employer branding; customization

## 1. Introduction

Technological options facilitate new opportunities to engage in corporate branding and recruitment. Traditional recruitment processes have increasingly changed with the use of e-recruitment or e-tools [1]. Virtual career fairs are an interesting new option for many recruiters and exhibitors. Such fairs can be designed in ways that offer these attendees many choices on who to invite, and how to design their virtual booths, giving recruiters and exhibitors not just local, regional but also potentially global visibility. This development is in line with e-recruitment efforts and branding efforts worldwide. The purpose of the current paper is to introduce the reader to virtual fairs. Several research questions will be explored in the context of an organizational case study, with an emphasis on recruitment and employer branding. These research questions consider the pros and cons of virtual fairs, their potential value to employers, and, more specifically, their value to recruiters and exhibitors.

The paper is structured as follows: The first section introduces different fairs and explores the connection these have to employer branding and recruitment. The second section includes a description of the organizational case study, the Norwegian company Global Forums, and outlines our research questions. Section three outlines the data collection efforts used to answer our research questions. This is followed by a fourth section that summarizes the results on the pros and cons as well as recommendations for users and creators of virtual fairs. The final discussion section reviews the findings and outlines possible future avenues for research.

## 2. Background of the Research

### 2.1. From Traditional Career and Trade Fairs to Virtual Fairs

A short introduction to fairs provides a better understanding of what Global Forums specializes in. Recruitment incorporates all activities and practices that an organization carries out in order to identify and then attract prospective employees [2]. To attract such talent, it is important for employers to understand job seekers and what kind of opportunities may interest them. Career fairs (also known as job fairs) attract a diverse group of people: unemployed job seekers as well as those already in employment but seeking other opportunities. Another advantage with career fairs is the large number of exhibitors that gather in one place, enabling both employers and potential candidates to meet in one location. Such events enable attendees (including other recruiters and exhibitors) to interact directly with other participants (talents) and recruiters from companies represented as exhibitors [3].

Trade fairs are usually organized to connect buyers, competitors, and collaborators. The main functions are related to product displays, professional interaction, and product branding. The opportunities to observe and learn from others (such as industry leaders) are a particular advantage of traditional career and trade fairs [4]. In the case of both career and trade fairs, market leaders attract a larger number of visitors and interest. Participants are expected to come to the location of the fair. The physical layout of the venues chosen for such fairs often means that exhibitors with lower market shares and less popular recruiters are able to draw the attention of potential visitors, making such fairs particularly helpful in increasing their visibility. This has raised concerns about the cost effectiveness of these fairs [5,6]. Both career and trade shows can be very costly to run, host and participate in. Trade shows often consume a large share of firm's promotional budgets. Over the last two decades, more and more e-recruitment and online interactive communication tools have emerged. Recruitment is now facilitated by online platforms that allow for both candidate and employer branding (e.g., LinkedIn), online psychometrics assessment tools frequently offered by consultancies to pre-screen potential candidates on behalf of companies, to conferencing software to support live interactions between recruiters and candidates (e.g., Skype, Adobe Connect, Cisco Webex). As a result, a number of career and trade fairs are now also hosted on online platforms by businesses or online social networks.

In this paper, we focus specifically on virtual career fairs. The development of virtual career fairs seems to be in line with the changing needs of both job seekers and employers, in an increasingly proliferated workplace. This projection is in line with the use of mobile devices and online platforms by job seekers. For example, 47% of job seekers (in the United States) are using mobile devices in their search for a job in both their personal and work places or on their commute to work [7]. We believe that these career fairs are noteworthy because they provide new opportunities in terms of employer branding and recruitment, while also overcoming some of the limitations of traditional fairs. We explore these points in reference to the literature next.

### 2.2. Employer Branding and Recruitment at Virtual Fairs

Employer branding is a growing field, and several definitions have emerged from academic research [8,9]. Employer branding is the “process of building employer identity directed at existing and potential employees, in order to differentiate the firm from its competitors” [10]. In the context of career fairs, the focus of this paper is on employer branding in relation to attraction and retention of talent (rather than specifically on other aspects of employer branding associated with brand equity, brand loyalty and employee engagement; see also [11]).

The goal of the recruiters participating in these events is to initiate a conversation with potential applicants, “either for the explicit purpose of encouraging them to apply, or to create groups associated with the company so that these connections can be used for recruitment purposes” [12], in line with employer branding efforts to raise organizational advocacy (e.g., [13]). There are other benefits for companies to embrace the use of e-tools for their recruitment processes, and these benefits might be transferable to virtual career fairs. For example, e-tools might enable recruiters to reach passive job

seekers, may shorten the recruitment cycle, reduce employee turnover, and lower costs (a motivator for exhibitors to participate in virtual trade fairs, [14]). Smaller companies may particularly benefit from e-recruitment and online employer branding due to the lower costs [1].

A number of theoretical frameworks can contribute to our understanding of virtual fairs as a means to attract new talent. The first one is the ASA (attraction-selection-attrition) cycle, a model for understanding the person perspective of organizational behaviour. This model captures the challenges in attracting talent, selection and retention in organizations [15]. This model [16] proposes that attraction to an employer, the selection into the organization, and the subsequent retention and attrition will lead to a kind of filtering process, which subsequently results in organizational behaviour being determined by those who are retained. This model, therefore, recognizes that situations determine people's behaviour and vice versa [16]. Virtual fairs reflect the decision-making process of an organization to seek more visibility among peers and competitors, while also reaching talent across numerous alternative means (including virtual ones). Moreover, the previous experience of decision-makers with recruitment and branding activities may shape the organizational behaviour (such as the adoption or rejection of virtual fairs).

The second framework is signalling theory. This theory proposes that applicants' attraction to employers is in part influenced by the signals (information) they receive about the organizational characteristics (see work by [17,18]). Some evidence seems to support this theory. Previous research [19] reported that organizational image mediated the relationship between the perceived aesthetic website features of the e-recruitment sites and organizational ratings in a sample of undergraduates. The features of the virtual representation of organizations in virtual fairs (e.g., via virtual booth) may similarly operate as predictors of attractiveness, mediated by the information shared strategically as part of the recruiters' employer branding efforts. Applicant inferences about the employers and identification with the potential employer (e.g., achieved by exposure to the employer brand and image) may, therefore, play an important role in predicting attractiveness of organizations and job pursuit intention (see also [20]).

Virtual fairs give employers a new platform to engage in employer branding and recruitment activities to attract new talent. What is more, virtual fairs may also enable organizations to be more selective in their choice of candidates. Or, as Schneider (1987) [15] proposed, due to careful attraction and selection (as well as attrition), organizations can shape what kind of people they employ—and via these people, they can also shape their future recruitment activities. This selection is in line with striving to achieve a better fit (e.g., see meta-analysis by [21]), not just to the job but also supervisors and the organizational environment. Prospective applicants at job fairs reportedly gain a sense of the 'personality' of an organization and are thus able to assess their potential fit with the organization [22]. Related to the point of attrition, researchers [13] also found that the outcomes of employer branding, such as job satisfaction and psychological contract, influence subsequent employee retention. In their qualitative study of an IT company, a positive relationship between employer branding and commitment also support brand advocacy by employees [13]. Such advocacy may complement employer branding and recruitment at virtual fairs. Careful recruitment and interaction with potential applicants may also reduce attrition due to poor perceived fit (e.g., to the role, team, or organization or potentially irreconcilable personal and organizational goals (e.g., learning vs. task-focused roles; see also work on the positive link between organizational attractiveness and educational opportunities, [23]).

### 2.3. Research Rationale and Questions

The current article makes two contributions to the literature. First, the exhibitors' perspective has already been studied in relation to virtual trade shows and virtual marketing [14], but not to date with regard to virtual fairs. Second, most information on virtual fairs is available via press reports, university websites and various blogs rather than academic journals [24,25]. In practice, the knowledge gap is still pronounced, particularly in terms of the role of recruitment and employer branding as

related to virtual fairs. Therefore, the current article hopes to explore this gap in the literature by considering one example in Norway (Global Forums, introduced in next section).

The goals of the current work were to explore the pros and cons of virtual fairs and their potential value to employers, specifically the recruiters and exhibitors as demonstrated in a case study of virtual fairs. In addition, we wanted to provide first insights into a hitherto relatively unknown area of research as several questions currently remain unanswered. We list several here that we aim to explore in our work.

RQ1: What are the benefits of virtual career fairs?

RQ2: What are the perceived challenges of virtual career fairs?

RQ3: What do recruiters and exhibitors recommend as means to improve the branding and recruitment benefits of virtual fairs?

### 3. Methodology

#### 3.1. Organizational Case Study: Global Forums AS

The purpose of the current case is to introduce readers to the Norwegian company Global Forums. Global Forums AS is a company based in Oslo, Norway. This organization is the first firm in Norway to launch a virtual career fair and held its first career fairs in 2013. The main focus of Global Forums' business activities focus on two virtual career fairs, the 'Skandinavisk Online Karrieremesse' and 'Global Talent Week'. The first 'Skandinavisk Online Karrieremesse' was virtually attended by about 3000 participants from all over the world. With the 'Skandinavisk Online Karrieremesse' and 'Global Talent Week', Global Forum is actively participating in shaping the experience of e-recruitment for organizations, graduate job seekers and professionals. In addition to virtual fairs, Global Forums also hosts online conferences.

The primary goal of the company was to help people in the pursuit of their dream career, and the company is working towards that vision by focusing on strategic collaborations, for example, with experts within recruitment, employer branding and social media marketing. An additional goal is to form a community with other organizations, which in turn will create synergies with several organizations in Norway (including sectoral and public sector representatives, private companies and trade unions). There are no direct employees, except for the chief executive officer. However, many people are involved in the firms' activities on a freelance basis and through a volunteer ambassador program. The selected volunteers represent talents from different parts of Scandinavia. The rationale for the development and maintenance of an online community of talent and employers, and thus the creation of this new domain in the job market, was outlined by the Chief Executive (and second author) as follows: "It's important for us to have an online community with a connection between individuals who might not meet physically." The company has therefore invested significant time to establish a relationship based on trust with their various stakeholders. This included building an online community of ambassadors that promote Global Forums and its events.

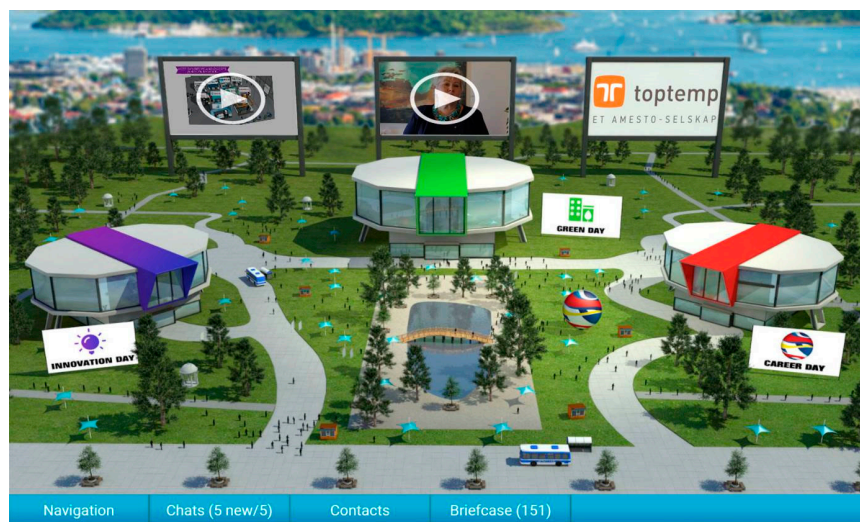
Global Forums was founded to meet the need of employers who want to connect to candidates across Scandinavia regardless of their geographic dispersion. The company also responds to changing economic circumstances, business cycles and the seasonal nature of recruitment activities. Other factors also come into play. In Norway, many employers compete for talent in a small labour force, a situation that these employers share with employers in other Scandinavian countries. The value of virtual fairs is related to the perceived greater need of employer branding and thus visibility of one's industry in the face of such competition, as well as the need to use every opportunity available to graduates and other qualified talent, talent that can be very selective. This means both employer branding and recruitment are significant drivers for participation at such fairs.

Regional developments also determine the selection of candidates that Global Forums is asked to find for exhibitors and recruiters. The target groups for career fairs are identified in surveys sent out to the exhibitors and recruiters, asking what kind of profile they look for in candidates. This information



then helps Global Forum to invite specific target groups to the event. Typically, the primary target groups are students and professionals with a background in economics, IT and engineering. There is also an increasing interest in inviting talent from other disciplines. However, the key is to focus on the needs of the clients—specifically the recruiters and exhibitors. This means the events run by Global Forums are often for invited guests within a specific region (within Norway but also across Scandinavia as a whole). Invitations are shared with the help of specific membership and student organizations, partners and exhibitors. Individuals can also request an invitation code to certain events when their stated profile matches the kind of profile recruiters at the virtual fair are looking for. The growing online community and set of ambassadors support online engagement and interaction among all those participating in these fairs.

Figure 1 shows an example of how a virtual career fair may mirror the characteristics of regular career fairs (picture courtesy of Global Forums). The example highlights how the company incorporates web service analytics and web data visualization to create a service that supports virtual fairs.



**Figure 1.** Virtual fair representation (picture courtesy of Global Forums).

### 3.2. Data Collection Rounds

The research involved several participants in two separate data collection rounds. The first round included a semi-structured interview that was conducted with the CEO of Global Forums (GF from here on). The interview was conducted in Norwegian with the Chief Executive of the company as well as four exhibitors that were also responsible for recruitment in their organizations and who had participated in virtual fairs organized by Global Forums in spring 2016. A focus group setting was selected in order to stimulate new ideas and creative concepts while also being able to assess the degree to which participants agree with each other and reach a consensus. Smaller focus groups with around 4–6 participants are more accessible to recruit and host [26], as well as being more comfortable for participants. The participants were either active recruiters or exhibitors at the event. In addition, the facilitator of the focus group discussion was employed by the company at the time of data collection.

The participants in the focus group were picked because they were all HR representatives who were based near the capital of Norway. The four participants included two males and two females between the ages of 32 and 39 years old. Moreover, their similar professional background and age meant we had a relatively homogenous sample to explore their experiences in a more in-depth manner [27]. The recruiters and exhibitors represented several industries, three of which operate internationally, and one limited to domestic operations. The diversity of these companies reflects Global Forum's overall client base. All recruiters and exhibitors had a booth at Global Forum's virtual career fairs. The group represented Norway-based companies from various industries such

as Certifications, buildings and construction, chemical, and road management. All participation was voluntary and not remunerated.

### 3.3. Interview Guide and Focus Group Themes

The semi-structured interview with the CEO focused on obtaining background information on the company and the number of fairs run to date. Main questions were: (1) What are the reasons why companies attend career fairs? (2) What are the main reasons why companies attend virtual career fairs? (3) What are the advantages and disadvantages of virtual vs. traditional career fairs? (4) How do you assess whether or not a career fair has been a success? The answers from the first expert interview influenced the questions put to the participants in the focus group. The interview with the four focus group participants included several themes, specifically recruitment and employer branding in the context of virtual fairs. The aim of conducting a focus group interview was to get a clearer picture whether or not virtual career fairs have an effect on employer branding and recruitment, in comparison to traditional on-site fairs. In addition, the claims of the CEO were presented as statements to the informants in the focus group to verify these assertions.

## 4. Results

In the following section, we summarize the main findings and analyse these in relation to existing research and work on employer branding and recruitment. Each research question is discussed separately. The expert interview with the CEO provided the answers in response to the first research question on the pros and cons of virtual fairs.

### 4.1. Benefits of Virtual Fairs (RQ1)

The benefits of virtual fairs pertain to the (a) visibility and branding; (b) costs; and (c) analytics-based customization.

#### 4.1.1. Visibility and Branding

In line with the expert report, branding and visibility appear to be key opportunities identified by the focus group participants. This may be particularly the case when the industry may be less known to candidates (e.g., those who consider a transfer from one sector to another). Presence at these virtual fairs was seen as key to informing candidates about the employer but also to generate positive word of mouth. Attending virtual fairs was seen as a way to be noticed by potential candidates. Being able to gain an overview of exhibitors was also seen as a benefit, while the online format was seen as enabling dialogue with the different visitors. In addition, interest in virtual fairs was driven by motives such as “employer branding, related to strategy about becoming more digital [ . . . ]. It’s possible to measure the effect of virtual career fairs, and not traditional ones. And, we can meet with professionals” in employment as well as students seeking new opportunities. Being seen was another aspect: “We want to be present where things happen, to show that we are not ‘slow’”.

Virtual fairs provide organizations with increased visibility in front of potential visitors (the numbers may be considerable, as Global Forums has seen 3000 to 4000 attendees at their virtual fairs). This kind of presence is of significant value to business as virtual fairs offer employers a novel and innovative branding opportunity. The goal is “to be visible, spread information about the company, employer branding, not recruitment specifically but connect with people” and “to meet more experienced candidates” who would not usually attend such events. This suggests that the online format was seen as a means to reach talent that may be difficult to recruit or entice to attend alternative events, while also presenting the company in both a “professional and stylish” fashion. Visibility was seen as adding value while being able to reach the talent group and costs were equally motivating for the focus group participants.

Figure 2 outlines the benefits of virtual fairs in terms of location. As the virtual venue can be tailor-made, no exhibitors or recruiters are potentially disadvantaged by being located in a location less likely to be reached by job seekers.

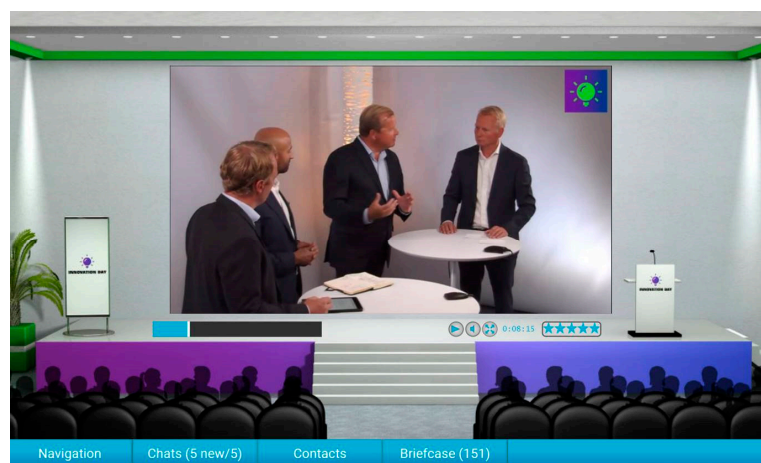


**Figure 2.** Representation of virtual booths at a career fair (picture courtesy of Global Forums).

#### 4.1.2. Costs

The expenditure for hires was a common concern for several focus group participants. According to the CEO, branding and recruitment are the main drivers of attendance. Some figures suggest that virtual career fairs can reduce costs by 70 percent per hire [28]. The reduced costs for exhibitors and recruiters may also encourage entrepreneurs and small businesses to participate, as online hosting allows them to engage with talent in a similar way as big business. Virtual fairs present employers with the opportunity to reach more talent, reach experts or smaller target groups, and candidates who are in employment already. In addition, early interactions with potential talent allow recruiters to screen and vet candidates earlier in the process, reducing costs and providing immediate feedback opportunities to the candidates. Virtual career fairs connect job seekers to a platform on which they can actually meet the people who work at the company.

Figure 3 on the next page demonstrates the ease with which talks and conference presentations can be incorporated into virtual fairs, allowing recruiters and exhibitors to invite potential job seekers to their events.



**Figure 3.** Example of a discussion between stakeholders (picture courtesy of Global Forums).



#### 4.1.3. Analytics-Based Customization

Virtual fairs also support customer-oriented analytics. The computer-mediated nature of virtual fairs provides organizers, but also recruiters and exhibitors to collect data about the number and characteristics of individuals who showed an interest in their company by attending and reviewing information about the exhibitors and recruiters and selected content in their virtual booths. Such recorded data can, in combination with verbal feedback, provide a rich source of engagement for the participants, recruiters and exhibitors alike.

The virtual booths can be designed to the specifications of the business and business needs, allowing for customization—for the benefit of exhibitors and participants. The employers may interact with and even interview potential candidates. Participants may interact on public message boards, or privately with employers via virtual booths. The employers may also use different design functions for virtual booths, allowing them to design them in the corporate image and brand. Depending on the needs of clients, virtual fairs such as those run by Global Forums can include panel discussions and company presentations in a virtual lecture hall, which are opened to invited guests only. Membership and student bodies, partners and exhibitors can selectively invite people in pre-specified target groups to attend such events. Profile matching to events is another option available to candidates, making them beneficiaries of this customization of virtual events during career fairs. And as we would argue, both these two drivers are also related to one another and mutually reinforcing. For those visitors who are in employment at the fair, the online option allows them to engage with recruiters without having to share their current work details.

At the bottom of Figures 1–3, a number of options are presented. All attendees—job seekers, recruiters and exhibitors—can use these options to (a) navigate the online fair and (b) chat with others (all attendees at the virtual fair can chat with several others simultaneously). In addition, all attendees are presented with an additional (c) contact option to start conversations with others at the fair. The last option (labelled ‘Briefcase’) allows all attendees to save all chats of interest for future reference and later access. These options support decision making, but also monitoring and optimization, both of which are referenced in the next subsection.

#### 4.2. Challenges of Virtual Fairs (RQ2)

The expert interview and perspectives of recruiters and exhibitors also highlighted the challenges that virtual fairs may generate. These pertain to the (a) lack of online engagement, (b) preparation and staffing costs, (c) lack of guidelines, (d) talent access and identification, (e) security and infrastructure, and (f) long-term planning.

##### 4.2.1. Online Engagement

Many participants (an estimated 5 out of 6 visitors) stay silent and do not actively engage. This can make it challenging to demonstrate value. Virtual fairs cannot replace traditional, face-to-face interactions, but they can represent a complementary means to engage in recruitment and employer branding—which may become the norm for some in the future. This means that a significant amount of time and effort is invested in creating and maintaining the online community and the network of ambassadors, for the career fair, the exhibitors and recruiters. Nevertheless, as one focus group participant noted: “It’s possible to be blinded by numbers. 300 chats, but what does the target group get out of it?” Hits alone may not be as informative, which is why interactions and additional feedback were also valued. Introducing and developing more tools to assess the online system’s effectiveness in supporting and encouraging online engagement is therefore important to virtual fairs.

##### 4.2.2. Preparation and Staffing Costs

While virtual fairs have the potential to be less resource-demanding (or at least cost-neutral), the costs may be of a different nature—namely the time required by users to familiarize themselves with

the services, estimate employee time needed to support such activities, and optimize presentation and outreach. The online format is new to many exhibitors and recruiters. The lack of experience and prior exposure to such fairs meant all participants faced more of a learning curve. All participants essentially agreed that virtual fairs were not easier to prepare for than traditional ones. Since virtual fairs do not have the same capacity issues as regular venues, the main costs pertain to staffing, as the organization has to have enough employees to respond to queries when demand peaks. Like many innovations, virtual fairs were seen by our focus group as a trend that might suffer from economic downturns and cost-cutting, similar to traditional fairs. In such climates, the participants anticipated a drop in the number of exhibitors.

#### 4.2.3. Lack of Guidelines

In the absence of best practice guidelines, many exhibitors have had to experiment, identify and find their own solutions. More is needed to engage passive participants in virtual fairs effectively. This requires organizations to find new ways to demonstrate and increase the profile. At present, it is unclear what effect branding has on recruitment and vice versa. In-depth studies could provide further insight here. In addition, the link between attendance and direct hiring is less clear; many recruiters prefer to interact with the potential employees themselves in person.

#### 4.2.4. Talent Access and Identification

As the needs of the clients change, so will the demands for the virtual fair providers. Companies may expect significant help when seeking alternative talent from areas they have not previously identified or have not been able to recruit in previous attempts. In addition, experiences with career fairs were mixed across the focus groups, as expectations and actual deliverables might not necessarily align, especially as the success depends on the specification, accessibility and availability of talent (visitors) and other external circumstances (recruitment interest, other recruitment fairs) that are difficult to plan for. The option to have ‘open’ sessions or closed sessions (only available to attendees who have been given a code by the employers or exhibitors) provided one means to reach many or a specific audience, while also monitoring who responds to invites.

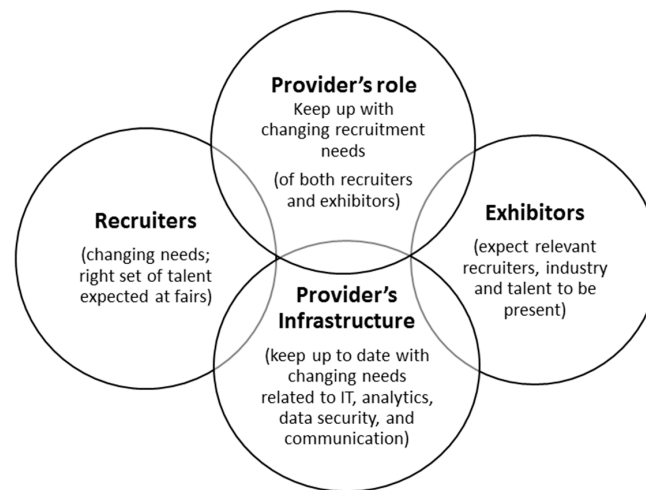
#### 4.2.5. Security and Infrastructure

Virtual and physical computer-driven IT worlds seem to be both leaner and smarter. Platforms for interactions and efficient infrastructure based on big data, cloud computing, mobile and social media, forms the “Nexus of Forces,” which is continuing to evolve [29]. But despite the “first-mover advantage”, virtual fair organizers—like virtual trade fair organizers—face the risk of losing such an advantage by not keeping up with rapid changes in technology [30]. A related concern was the amount of trust recruiters and exhibitors placed on the infrastructure and security of all technological aspects that feature in virtual fairs. Those responsible for maintaining virtual fair infrastructure and data security management may thus need to stay up to date, integrate with or be complementary to other systems, while ensuring all transactions are secure. Guidance on potential security risks has been published by a number of online resources that are readily available, such as NetworkComputing.com, HelpNetSecurity.com, and Kaspersky.com. We do not currently have the means to compare the platform used by Global Forums AS with other platforms for proprietary and copyright reasons. Each provider of virtual fairs operates their own system, many of which will be custom-made.

#### 4.2.6. Interdependencies

As our analysis showed, organizing virtual fairs is not without challenges, as outlined by our participants in Norway. A number of inter-dependencies exist that require a holistic and dynamic approach to managing client needs and expectations, demands on infrastructure, and trend spotting to anticipate how labour market, industry, and demographic change. For example, demographic change can influence the number of candidates graduating from university, while governmental or regional

legislation may influence the number of vacancies that public and private recruiters have each year (e.g., new legislation on data security often leads to new appointments). Similarly, more competition for candidates may further determine the budget recruiters and exhibitors are willing to dedicate to virtual fairs. In order to clarify these inter-dependencies, Figure 4 captures the challenges that arise for virtual fair providers such as Global Forums when we consider the needs of two main stakeholders (not including the interests of job seekers, public stakeholders responsible for local employment and so on; see context section). Please note that recruiters may also be exhibiting, while exhibitors may also recruit talent at virtual fairs.



**Figure 4.** Challenges for virtual fair providers.

#### 4.3. Recommendations for Success (RQ3)

As a final consideration, we asked recruiters and exhibitors for recommendations on how to increase the potential benefits of virtual fairs, specifically in terms of employer branding and recruitment. The following recommendations were based on the reports from the focus group participants. Metrics were one of the areas that were recognized as important. Without such metrics, it is difficult to grasp the added value from attending virtual career fairs, such as fair participants visiting exhibitor booths without chatting. From the exhibitor's point of view, functionality for enabling communication is important and to provide information in a good way towards all visitors. Furthermore, it seems that the organization of career fairs is to some extent season-dependent, with early spring and early autumn as preferred by the selected exhibitors.

The presence of market leaders or popular graduate employers was considered another important aspect to virtual fairs. Popular or unique exhibitors were reportedly seen as a means to increase the potential number of visitors.

Similarly, recruiting the right exhibitors and a good number of representatives from the same industry was also seen as an added bonus as it supported employer branding as well (visitors get a sense of what companies in the same sectors have in common and what differentiates them as employers). Indeed, employer branding and the perceived attractiveness of employers has been linked to the prestige of the organizations [11,23]. Efforts to identify the right target groups for the exhibitors and recruiters to attend an event were also seen as key to increasing the satisfaction of these parties. Opportunities for continuous customization may further raise the perceived branding value of virtual fairs. Moreover, the sales packages towards exhibitors and the service provided are considered important amongst the selected exhibitors.

Providing career advice and speakers was seen as another way to draw the target groups to such events, while the use of ambassadors to promote the events was seen as another means to reach those target groups. Another recommendation was to get more media involved to increase the exposure and

visibility of the fair. Involving student organizations and seeking continuous feedback from students for continuous improvement were seen as further steps towards success.

## 5. Discussion

The goal of the current study was to learn more about the perspectives on virtual career fairs, considering the perspective of an organizer and participating recruiters and exhibitors. In our paper, we further explore the link of these fairs to employer branding, recruitment, and the larger context (including opportunities and threats) that influence how such virtual career fairs are perceived. This exploration was also complemented by a collection of recommendations that could improve employer branding and recruitment benefits associated with virtual fairs. In the following sections, we briefly outline some of the lessons learned by the company, recruiters and exhibitors via the evaluation conducted by the first author. These lessons will be relevant to organizations that are thinking of attending virtual fairs as part of a recruitment or branding exercise (e.g., potential clients), seek to organize such events themselves, or would be interested in supporting virtual fair providers using their own set of skills and resources (e.g., prospective suppliers). Where appropriate, we also provide references to specific publications that address these points as these may be relevant resources for practitioners interested in specific themes.

### 5.1. Employer Branding and Recruitment

Virtual fairs provide organizations with an alternative approach to market their organization and seek new employees. The possibilities of customization and metrics to track engagement provide new means by which organizations can monitor the effect of such activities. Metrics from virtual fairs may enable organizations with existing employer branding plans to evaluate and redesign these objectives while helping others to set out their own baselines and strategies. Such steps could provide recruiters and exhibitors to better evaluate the impact and the effectiveness of their branding strategies (a topic of concern also among exhibitors of virtual trade shows, [14]). The findings of our evaluation showed that virtual fairs are a means by which employers can engage in employer branding, while the reports by the focus group participants also support the role of such fairs to support recruitment. The extent to which virtual fairs would complement traditional recruitment for most organizations may be subject to the context, including the organizational use of technology and such platforms (e.g., existing adoption of online tools), the audience they want to meet (e.g., IT people have a preference for online fairs), and the kind of (qualitative or quantitative) feedback and information sought by the organizations. Indeed, exhibitors seem to have better access to job seekers at an online career fair because the online format facilitates an increased reach to relevant target groups. Moreover, companies may attend in order to encourage participants to apply for jobs [12]. Nevertheless, while the online format makes it easier to measure the effects of attending, the exhibitors were largely in agreement that virtual fairs did not reduce their workload.

### 5.2. Business Value

The pros and cons of such fairs, as observed in the evaluation of fairs run by Global Forums, tend to focus on measurement and demonstrable business value, recruitment and outreach to talent. New technological means allow for large-scale hosting of such events. These results speak to the branding value gained by employers in terms of innovation and application value [10]. Virtual fairs may be a more efficient and cost-effective [28] than regular job fairs as they allow employers to reach out to a larger group of potential employees. Virtual fairs should only present the most useful information but do so with consideration of the resources available (the site needs to be 'minimalist' by design, see [31]).

This means that virtual fairs, while requiring certain hosting costs and the technical infrastructure, are not limited in scale in a similar way to traditional fairs. Some virtual career fairs in India (organized by organizers in India) have been attended by more than 300,000 participants. The organizers did

not experience any technological problems. In most cases, virtual fair providers utilize professional suppliers to meet the technological requirements of such web traffic. This suggests that virtual fairs are often events run conjointly by a number of collaborating parties: One involving the provider, suppliers, and volunteers or ambassadors in various different locations or event countries. This requires a degree of coordination beyond what more traditional and thus localized career fairs, which usually rely on local suppliers and support, can offer.

However, the use of analytics, data management, and customization services also require significant technical skills in addition to certain analytical skills on top of the technological skills and infrastructure from the organizers of such virtual fairs. This may change the cost-benefit equation accordingly. Organizations interested in evaluating their clickstream data will similarly have to have access to the right in-house (or third-party) expertise to make sense of this data and draw specific conclusions on how their online engagement and commitment to virtual fairs result in tangible gains for the company.

### *5.3. Context Matters in Employer Branding and Recruitment*

Virtual fairs have emerged in several markets and countries, but recruitment and employer branding practices vary between countries, industries, sectors and even single organizations. This fact makes it hard, if not impossible to follow a best-practice approach, in order to measure the effects a virtual career fair has on employer branding and recruitment. Despite these concerns, the development and increasing utilization of virtual career fairs in several countries (e.g., Norway, Germany, USA, and India) seems to be in line with the changing needs of both job seekers and employers, needs that are in part attributable to an increasingly proliferated and computer-mediated work-place.

Despite the virtual nature of career fairs run by Global Forums, these fairs share some similar constraints with traditional fairs. First, local or regional changes in trends still influence the respective needs of employers. Barriers to labour mobility in numerous countries make it more likely that regional, rather than global, career fairs will achieve successful employer branding and recruitment outcomes, especially since the large majority of employers are not global players but often small and medium enterprises located in specific regions of the world. And second, it is likely that the demand for more and more niche-oriented career fairs will increase as employers seek specific talent in highly specialized job markets [24,25]. This suggests that a one-size-fits-all approach is misplaced. Finding ways to meet the divergent needs of different recruiters in different countries, labour markets and industries is a significant challenge for virtual fair providers wishing to operate across national and geographic boundaries.

### *5.4. Virtual Fairs: Complementary or the New Standard?*

Companies seek to be attractive employers [23], and fair participants are able to apply for jobs, connect with HR managers and get one step closer landing a job. In traditional fairs, job seekers are very likely to disappear from the recruitment process, if they are not attracted at the first phase [23,32]. One of the most promising directions for job-choice research is attached to identifying social influence [23]. Employers have limited impact in the process of how job seekers are influenced by for example family and friends, who often tag along at traditional career fairs targeting new university graduates. At the same time, technological tools allow more audiences and different stakeholders to interact with one another simultaneously. In addition, with highly qualified and often experienced talent, many virtual fairs are preferable. This means virtual fairs may become the norm for certain occupations and recruiters.

While it is true that virtual fairs can offer some of these in-person experiences, there is also room for improvement in order to embed such experience online, which is seen by many recruiters as an essential part of talent attraction. This may be a hurdle to recruiting more talent to attend virtual fairs as many potential candidates know that interacting with hiring managers or HR representatives in person can be a critical step towards landing a job [33]. Providing similar means online is still



an area in need of more development. This means virtual career fairs may be best viewed as a supplement to, and not a replacement of, traditional career fairs. However, it may (as noted in the earlier section on branding), depend on the context. In traditional fairs, recruiters and attendees tend to have one-to-one conversations. Attending virtual fairs generate significant learning gains for multiple parties simultaneously (not just the attendee). For example, recruiters can actually interact with multiple stakeholders, competitors and collaborators online, including different parties who may not usually be part of the conversation in traditional settings.

## 6. Conclusions

This paper set out to introduce readers to virtual fairs and Global Forums, a provider of virtual fairs in Scandinavia. Specific themes were identified, which related specifically to branding, recruitment, and the various gains and obstacles to the success of such fairs (both in terms of the provider and those attending these events). Virtual fairs actively contribute to our understanding of online employer branding and recruitment, lessons that may not only be useful in the Norwegian context. Given the benefits of such fairs, the authors anticipate the increasing adoption of virtual fairs in Europe. This could potentially lead to virtual fairs becoming the new standard for recruitment and exhibitions, particularly in the technologically driven sectors, among smaller and medium-sized enterprises. In addition, the present case study presents a number of starting points to re-evaluate assumptions about how technology may facilitate branding and recruitment online as part of such fairs. As we demonstrate, virtual fairs have the potential to go mainstream. However, their implementation and durability will depend on the ability of providers to carefully balance the needs and demands of their clients—while also maintaining an operational slack and infrastructure that allows for growth and flexibility. In the last section of the paper, we briefly outline the limitations of our research and summarize future research avenues in relation to virtual career fairs.

### 6.1. Limitations

The present study is the first exploration of virtual fair experiences among Norwegian experts, which is an issue in terms of generalizability of our findings [27]. The nature and small number of participants are one limitation. This study originally aimed to conduct focus group interviews with five participants but ended up with four, which is also sufficient. However, the disadvantage of smaller groups is that the total range of experiences will be limited [26]. Other limitations include data collection instruments not being piloted in advance, and not involving event participants, such as job seekers in the exhibitor's target group, as informants [27,34]. Nevertheless, we hope that this study will be thought-provoking as the first of its kind to provide insight into how virtual fairs operate, in this case in Norway, as viewed by recruiters and exhibitors who participate in such events.

### 6.2. Future Research

A number of unknowns still exist, many of which are relevant to organizations interested in participating in virtual fairs. In the field of academic research, many researchers have been exploring employer branding with regard to attraction and retention, and less on how brand perceptions are formed. This means we know very little about how virtual fairs shape such perspectives beyond the impressions shared by the recruiters and exhibitors in the evaluation of virtual fairs run by Global Forums. This situation is made more challenging for providers such as Global Forums when we consider that many organizations may not have clearly defined branding objectives and strategies (while recruitment strategies are often metric based and therefore easier to support).

At the moment, the most common metrics in use by most organizations investing in employer branding are average retention rate, employee engagement level, cost per hire, number of applicants, as well as new hire quality. This suggests that the measurement of recruitment performance and employer branding go hand in hand [35]. Future research may wish to examine branding and recruitment effects by examining quantitative data (e.g., analysing the actual statistics collected in virtual fairs for specific

employers that are supportive of such studies). Accordingly, several exhibitors are using providers that supply both rankings and statistics. Cooperating with such providers may provide one important alternative option by which researchers and practitioners can explore the effects of organizational branding and recruitment activities at such events. This may be particularly relevant since cultural factors might have an impact on attributes selected by exhibitors and employers, which could also influence available measurements and statistics, both on the national and organizational level. How organizations use and record data may depend on the importance of fit to these organizations (e.g., job-organization fit). More studies on how different sectors have evaluated and utilized virtual fairs would provide more insight into the different effects of such fairs for employer branding and recruitment goals. In addition, the arrival of artificial intelligence may also support new services (e.g., by matching the resumes of attendees to the requirements of recruiters). A number of researchers have experimented with these approaches [36,37].

Even though it is possible to agree on a general level what recruitment and employer brand is in terms of best practice, organizations are influenced by their organizational culture, laws and culture in society. Schneider (1987) [15] also mentions the importance of studying organizational behaviour in context, including the culture or situations individuals and organizations face. Socio-cultural and institutional characteristics influenced design differently in their study of recruitment websites in the USA and Spain [38]. They noted that the e-recruitment sites in both countries differed substantially in terms of whether or not they provided information-oriented functionalities, touched upon key concepts of their national legal frameworks (e.g., commitment to diversity) and the use of terminology linked to employer branding (e.g., employee testimonials). Recruitment practices may also differ when recruitment requires organizations to manage talent in or from different countries (e.g., see also the recent review by [39]).

In the context of virtual fairs, the need to be distinguishable and attractive (e.g., employer branding and the interest in the good fit of candidates) are notions that also resonated with our participants, reflecting previous work on how organizational attractiveness positively influences potential applicant perceptions at job fairs [23]. In addition to sociocultural and institutional characteristics [36], cross-cultural reach corporate culture, and history may also influence the use of recruitment such as virtual fairs and the design of virtual booths. This avenue deserves future research.

And lastly, it would be interesting to see more work that explored the extent to which virtual career fairs can help to differentiate ‘we-find-you’ and ‘you-find-us’ approaches, and ‘push technology’ and ‘pull technology’ [12,40]. Given the metrics provided in virtual fairs, the attraction mechanisms may be more readily studied in virtual fairs. Automated and adaptable recommender systems already used for recruitment [41] could provide implicit and explicit feedback—and could be implemented at the virtual fairs. Such systems could complement information gained from log files record redirection effects via professional and organizational websites. This information may then be used to identify drivers for recruiters and applicants to seek each other out (e.g., other site referrals, brand images, perceived prestige, position and layout of booths). And, of course, more qualitative feedback collected at traditional career fairs and public actors may further help organizers, recruiters and exhibitors understand who specifically needs and uses, attends, and engages with virtual fairs and what the benefits of such engagement are for the various attendees (e.g., age groups, qualification levels, employment status).

**Acknowledgments:** This research was not funded by any agency or grant. We would like to thank the Norwegian focus group participants for their time and feedback. Lastly, we gratefully acknowledge the helpful feedback we received from Payal Kapoor from the FORE School of Management, as well as the editor and reviewers of *Future Internet*.

**Author Contributions:** The paper was prepared by all three authors. Ådne Stenberg Vik gathered the perspectives of the different parties (while studying at Edinburgh Napier University and working for Global Forums) with the help of the second author (the CEO of Global Forums, Bjørn Christian Nørbech). Ådne subsequently summarized the results as part of a dissertation supervised by the third author, Debora Jeske, who also provided assistance with the framing and revision of the paper.

**Conflicts of Interest:** The authors declare no conflicts of interest.

## References

1. Aboul-El, G.M.B.E. Development of a scale to measure the perceived benefits of e-recruitment from the viewpoint of the recruiter. *Acad. J. Bus. Retail Manag. Res.* **2014**, *9*, 40–51.
2. Barber, A.E. *Recruiting Employees*; Sage Publications: Thousand Oaks, CA, USA, 1998.
3. Kolodinsky, P.; Schroder, V.; Montopoli, G.; McLean, S.; Mangan, P.A.; Pederson, W. The career fair as a vehicle for enhancing occupational self-efficacy. *Prof. Sch. Couns.* **2006**, *10*, 161–167. [[CrossRef](#)]
4. Bathelt, H.; Schuldt, N. International trade fairs and global buss, Part 1: Ecology of global buzz. *Eur. Plan. Stud.* **2010**, *18*, 1957–1974. [[CrossRef](#)]
5. Rinallo, D.; Borghini, S.; Golfetto, F. Exploring visitor experiences at trade shows. *J. Bus. Ind. Mark.* **2010**, *25*, 249–258. [[CrossRef](#)]
6. Skallerud, K. Structure, strategy and performance of exhibitors at individual booths versus joint booths. *J. Bus. Ind. Mark.* **2010**, *25*, 259–267. [[CrossRef](#)]
7. Jobvite. Job Seeker Nation Study: Inside the Mind of the Modern Job Seeker. Available online: [https://www.jobvite.com/wpcontent/uploads/2015/01/jobvite\\_jobseeker\\_nation\\_2015.pdf](https://www.jobvite.com/wpcontent/uploads/2015/01/jobvite_jobseeker_nation_2015.pdf) (accessed on 8 November 2015).
8. Backhaus, K.; Tikoo, S. Conceptualizing and researching employer branding. *Career Dev. Int.* **2004**, *9*, 501–517. [[CrossRef](#)]
9. Edwards, M.R. An integrative review of employer branding and OB theory. *Pers. Rev.* **2010**, *39*, 5–23. [[CrossRef](#)]
10. Sivertzen, A.-M.; Nilsen, E.R.; Olafsen, A.H. Employer branding: Employer attractiveness and the use of social media. *J. Prod. Brand Manag.* **2013**, *22*, 473–483. [[CrossRef](#)]
11. Biswas, M.K.; Suar, D. Antecedents and consequences of employer branding. *J. Bus. Ethics* **2016**, *136*, 57–72. [[CrossRef](#)]
12. Wozniak, J. The use of gamification at different levels of e-recruitment. *Manag. Dyn. Knowl. Econ.* **2015**, *3*, 257–278.
13. Tanwar, K.; Prasad, A. Exploring the relationship between employer branding and employee retention. *Glob. Bus. Rev.* **2016**, *17*, 186S–206S. [[CrossRef](#)]
14. Gottlieb, U.; Bianchi, C. Virtual trade shows: Exhibitors’ perspectives on virtual marketing capability requirements. *Electron. Commer. Res. Appl.* **2017**, *21*, 17–26. [[CrossRef](#)]
15. Schneider, B. The people make the place. *Pers. Psychol.* **1987**, *40*, 437–453. [[CrossRef](#)]
16. Schneider, B.; Goldstein, H.W.; Smith, D.B. The ASA framework: An update. *Pers. Psychol.* **1995**, *48*, 747–773. [[CrossRef](#)]
17. Rynes, S.L. Recruitment, job choice, and post-hire consequences. In *Handbook of Industrial and Organizational Psychology*, 2nd ed.; Dunnette, M.D., Ed.; Consulting Psychologists Press: Palo Alto, CA, USA, 1991; pp. 399–444.
18. Spence, M. Job market signaling. *Q. J. Econ.* **1973**, *87*, 355–374. [[CrossRef](#)]
19. Lyons, B.D.; Marler, J.H. Got image? Examining organizational image in web recruitment. *J. Manag. Psychol.* **2011**, *26*, 58–76. [[CrossRef](#)]
20. Celani, A.; Singh, P. Signalling theory and applicant attraction outcomes. *Pers. Rev.* **2011**, *40*, 222–238. [[CrossRef](#)]
21. Kristof-Brown, A.; Zimmerman, R.D.; Johnson, E.C. Consequences of individuals’ fit at work: A meta-analysis of person–job, person–organization, person–group, and person–supervisor fit. *Pers. Psychol.* **2005**, *58*, 281–342. [[CrossRef](#)]
22. Russell, S.; Brannan, M.J. “Getting the Right People on the Bus”: Recruitment, selection and integration for the branded organization. *Eur. Manag. J.* **2016**, *34*, 114–124. [[CrossRef](#)]
23. Van Hove, G.; Saks, A.M. The instrumental-symbolic framework: Organisational image and attractiveness of potential applicants and their companions at a job fair. *Appl. Psychol. Int. Rev.* **2010**, *60*, 311–335. [[CrossRef](#)]
24. Miller, K.L.; McDaniels, R.M. Cyberspace, the New Frontier. *J. Career Dev.* **2001**, *27*, 199–206. [[CrossRef](#)]
25. Troy, M. 800+ engineering jobs at virtual job fair. *Control Eng.* **2009**, *56*, 26.

26. Krueger, R.; Casey, M. *Focus Groups: A Practical Guide for Applied Research*, 3rd ed.; Sage Publication: Thousand Oaks, CA, USA, 2000.
27. Saunders, M.; Lewis, P.; Thornhill, A. *Research Methods for Business Students*, 5th ed.; FT Prentice Hall: London, UK, 2009.
28. Recruiting Scope. Virtual Career Fairs—A Game-Changer. 2013. Available online: <http://recruitingscope.com/2013/05/virtual-career-fairs-a-game-changer/> (accessed on 29 November 2015).
29. Bojanova, I. The Digital Revolution: What's on the Horizon? *IT Prof. Mag.* **2014**, *16*, 8–12. [[CrossRef](#)]
30. Gerlich, R.N. The digital revolution. *Thunderbird Int. Bus. Rev.* **2001**, *43*, 321–328. [[CrossRef](#)]
31. McIlveen, P.; Gibson, E.; Fallon, S.; Ross, P. Process evaluation of an internet career fair. *Aust. J. Career Dev.* **2002**, *11*, 5–8. [[CrossRef](#)]
32. Beam, E.A. Do job fairs matter? Experimental evidence on the impact of job fair attendance. *J. Dev. Econ.* **2016**, *120*, 32–40. [[CrossRef](#)]
33. Kasprzak, L. Add career fairs to your job search strategy. *Chem. Eng. Prog.* **2014**, *110*, 19.
34. Stewart, D.W.; Shamdasani, P.N. *Focus Groups: Theory and Practice*, 3rd ed.; Sage Publication: Thousand Oaks, CA, USA, 2014.
35. Srivastava, P.; Bhatnagar, J. Employer brand for talent acquisition: An exploration towards its measurement. *Vis. J. Bus. Perspect.* **2010**, *14*, 25–34. [[CrossRef](#)]
36. Straccia, U.; Tinelli, E.; Colucci, S.; Di Noia, T.; Di Sciascio, E. A System for Retrieving Top-k Candidates to Job Positions. In Proceedings of the 22nd International Workshop on Description Logics (DL 2009), Oxford, UK, 27–30 July 2009; Volume 477.
37. Zimmermann, T.; Kotschenreuther, L.; Schmidt, K. Data-driven HR-Résumé Analysis Based on Natural Language Processing and Machine Learning. *arXiv* **2016**.
38. Simón, C.; Esteves, J. The limits of institutional isomorphism in the design of e-recruitment websites: A comparative analysis of the USA and Spain. *Int. J. Hum. Resour. Manag.* **2016**, *27*, 23–44. [[CrossRef](#)]
39. Allen, D.G.; Vardaman, J.M. Recruitment and retention across cultures. *Annu. Rev. Organ. Psychol.* **2017**, *4*, 153–181. [[CrossRef](#)]
40. Williams, S.; Verhoeven, H. 'We-find-you' or 'You-find-us'? Internet Recruitment and Selection in the United Kingdom. *Int. Rev. Bus. Res. Pap.* **2008**, *4*, 374–384.
41. Laumer, S.; Eckhardt, A. Help to find the needle in a haystack: Integrating recommender systems in an IT supported staff recruitment system. In Proceedings of the Special Interest Group on Management Information System (SIGMIS), 47th Annual Conference on Computer Personnel Research, Limerick, Ireland, 28–30 May 2009; ACM: New York, NY, USA, 2009; pp. 7–12.



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